



US007365031B2

(12) **United States Patent**
Swallow et al.

(10) **Patent No.:** **US 7,365,031 B2**
(45) **Date of Patent:** **Apr. 29, 2008**

(54) **CONDUCTIVE PRESSURE SENSITIVE
TEXTILE**

(75) Inventors: **Stanley Shigezo Swallow**, Middlesex
(GB); **Asha Peta-Thomson**, Middlesex
(GB)

(73) Assignee: **Intelligent Textiles Limited** (GB)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 71 days.

(21) Appl. No.: **10/240,567**

(22) PCT Filed: **Apr. 2, 2001**

(86) PCT No.: **PCT/GB01/01518**

§ 371 (c)(1),
(2), (4) Date: **Oct. 2, 2002**

(87) PCT Pub. No.: **WO01/75778**

PCT Pub. Date: **Oct. 11, 2001**

(65) **Prior Publication Data**

US 2003/0119391 A1 Jun. 26, 2003

(30) **Foreign Application Priority Data**

Apr. 3, 2000 (GB) 0008164.6
Jul. 24, 2000 (GB) 0001813.5

(51) **Int. Cl.**
D03D 15/00 (2006.01)

(52) **U.S. Cl.** **442/181**; 442/37; 442/192;
442/193; 442/195; 442/196; 442/197; 442/203;
442/217; 442/228; 442/229; 442/301; 442/364;
442/365; 442/372; 442/376; 442/400; 442/402;
2/902; 345/173; 345/174; 178/18.05; 174/68.1;
174/124 R; 428/364; 428/365; 428/377; 73/862.046

(58) **Field of Classification Search** 442/228,
442/229, 192, 193, 195, 196, 301, 181, 203,
442/217, 197; 428/400, 402, 372, 376, 364,
428/365, 377; 174/68.1, 124 R; 73/862.046;
2/902; 345/173, 174; 178/18.05
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,378,629 A * 4/1968 Rask 174/117 M

(Continued)

FOREIGN PATENT DOCUMENTS

DE 42 36 187 A1 5/1993

(Continued)

OTHER PUBLICATIONS

Lind et al. (1997). A Sensate liner for personnel monitoring appli-
cations. Proc. 1st IEEE Int. Symp. on Wearable Computers
(ISWC'97). Oct. 1997. Cambridge, Mass., USA: IEEE Press.

(Continued)

Primary Examiner—Andrew T Piziali

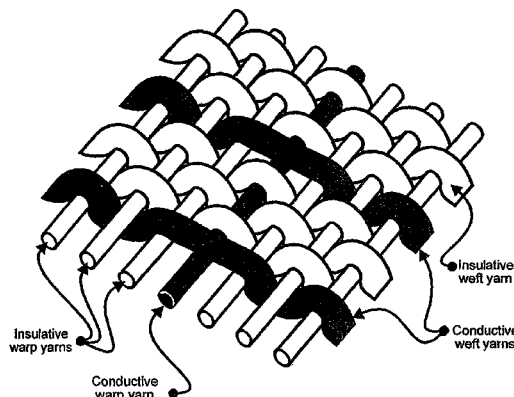
Assistant Examiner—Peter Y Choi

(74) *Attorney, Agent, or Firm*—Craig A. Fieschko, Esq.;
DeWitt Ross & Stevens S.C.

(57) **ABSTRACT**

A fabric including within its construction a first elongated
electrical conductor crossed by a second elongated electrical
conductor, the conductors being normally biased apart at a
crossover point of said fibres with an air gap between them,
whereby application of pressure in a direction substantially
normal to a plane of the fabric causes the conductors to make
contact. The fabric may be woven, knitted, non-woven or
plaited. The fabric can be used as a pressure sensor, switch
or other sensor.

25 Claims, 12 Drawing Sheets



Woven piece of fabric, showing conductive and insulative yarns,
with weft floats at crossover points between conductors